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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/997,662

11/29/2001

Patrick Duvaut

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10/05/2005

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
100 GALLERIA PARKWAY, NW
STE 1750
ATLANTA, GA 30339-5948

EXAMINER

WONG, BLANCHE

ART UNIT

PAPER NUMBER

2667

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/997,662

Applicant(s)

DUVAUT ET AL.

Examiner

Blanche Wong

Art Unit

2667

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 2 and 42-62 is/are allowed.
- 6) ☒ Claim(s) 3, 4 and 16-40 is/are rejected.
- 7) ☒ Claim(s) 5-15, 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>Jan'02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. With regard to cl. 34-43, Examiner suggests to remove the wording “configured to” in order to make the limitations more positive for examination. To be configured a function does not necessary imply that the device necessary performs that function.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, determining a noise floor (cl. 1 and 17); in cl. 42, a bin SNR calculator, a comparator, a bin designator, a cluster modulator, a cluster separator, a cluster frequency equalizer, and a linear summing circuit; in cl. 43, the two different modulation devices; in cl. 56, a SNR calculator, a comparator, a bin designator, and a logic circuit; in cl. 57, a cluster separator; in cl. 58, a cluster frequency equalizer, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

3. Examiner notes that Fig. 2 is Prior Art, but the Specification does not reflect so.

Specification

4. The disclosure is objected to because of the following informalities:

- On p.3, Examiner suggests removing “shown in FIG.2” because it is redundant in the description of FIG.2.
- On p.4, for FIG.7B, Examiner suggests replacing “cluster demodulator” with – cluster separator (demod) – in consistent with FIG.7A, or choosing to use either “cluster demodulator” or “cluster separator” in the documentation.

- On p.5, for FIG.11, Examiner suggests rewording “showing a non-limiting example showing the determination of the cluster pattern” to – showing a non-limiting example of the step of the determination of the cluster pattern --.
- Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 20-25,31-33,39-40** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to cl. 20,31,39, all in ln. 5, it is unclear whether “a predefined threshold SNR” is the same as the predefined threshold SNR in cl. 18, ln. 3.

7. There is insufficient antecedent basis for this limitation in the claim.

Claim 22 recites the limitation "the step of demodulating" in ln. 1.

Claim 33 recites the limitations “the means for demodulating” in ln. 1.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claim 3,4,16,18-19,26,27,29-30,34,35,37-38** are rejected under 35

U.S.C. 102(b) as being clearly anticipated by Cimini et al. (U.S. Pat No. 5,914,933).

With regard to cl. 3,26,34, Cimini discloses (see Fig. 1A and 1B)
modulating data bins (tones) to produce bin-clusters (group of N tones)(each M
cluster has N tones, col. 3, ln. 34-35; see also col. 3, ln. 66-67);

loading the bin-clusters with data (FFF devices converting digital stream into N
tones, col. 3, ln.12-13);

transmitting the loaded bin-clusters (FFF devices converting digital stream into N
tones for transmission over the sub-channel, col. 3, ln.12-14);

receiving the transmitted bin-clusters (receiving portion, col. 3, ln. 18); and
extracting data from the received bin-clusters (demodulating and decoding the
OFDM signal, col. 3, ln. 18-25).

With regard to cl. 4, Cimini further discloses a Fourier transform-based data
transmission system 41a-m (Fourier Transform devices, col. 4, ln. 12).

With regard to cl. 16,27,35, Cimini further discloses
computing a SNR of each individual data bin of a plurality of data bins (an
equivalent SNR is computed for each sub-channel, col. 9, ln. 10-11); and
selectively clustering individual data bins into bin-clusters (frequency selective,
col. 9, ln. 4; see also col. 9, ln. 3-7).

With regard to cl. 18,29,37, Cimini further discloses

comparing the computed SNR of each individual data bin of a plurality of data bins with a predefined threshold SNR (an equivalent SNR is computed for each multipath channel ... meeting some SNR, col. 9, ln. 10-12).

With regard to cl. 19,30,38, Cimini further discloses
defining individual data bins of the plurality of data bins as sufficient-capacity (good) data bins in response to the computed SNR of the individual data bin being greater than the predefined threshold of the comparing step (for any one realization of the multipath channel, some sub-channels will be good, col. 9, ln. 5); and

defining individual data bins of the plurality of data bins as insufficient-capacity (bad) data bins in response to the computed SNR of the individual data bin being not greater than the predefined threshold of the comparing step (while [other sub-channels] will be bad, col. 9, ln. 7).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 17,28,36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini.

With regard to cl. 17,28,36, Cimini discloses the method of cl. 16. However, Cimini fails to explicitly show 1. determining a noise floor of a signal transmission

system; 2. determining a type of data modulation in the signal transmission system; 3. defining a desired bit-error rate (BER) associated with the signal transmission system; and 4. calculating a signal-to-noise ratio (SNR) of each individual data bin of the plurality of data bins as a function of the determined noise floor, the determined type of data modulation, and the defined desired BER.

At the time of the invention, it would have obvious to a person of ordinary skill in the art to calculating a signal-to-noise ratio (SNR) of each individual data bin of the plurality of data bins as a function of the determined noise floor, the determined type of data modulation, and the defined desired BER. The suggestion/motivation for doing so would have been 1. for any given modulation and code rate, the SNR must exceed a certain threshold to ensure that a data packet will be decoded correctly; 2. SNR differs for any given modulation; and 3. when SNR is less than that certain threshold, the BER will be larger and the more retransmission of the same packet will be required until the packet is decoded correctly. If the SNR is at or above the threshold, then there is no need to increase the gain of the architecture to decode the data packets correctly.

There are not only a SNR threshold (noise floor), but also a BER (desired BER) at or above the threshold. Therefore, it would have been obvious to provide for 1.

determining a noise floor of a signal transmission system; 2. determining a type of data modulation in the signal transmission system; 3. defining a desired bit-error rate (BER) associated with the signal transmission system, for the benefit of 4. calculating a signal-to-noise ratio (SNR) of each individual data bin of the plurality of data bins as a function of the determined noise floor, the determined type of data modulation, and the defined desired BER, to obtain the invention as specified in cl. 17,28,36.

Allowable Subject Matter

12. **Claims 1-2,42-62** are allowed.
13. Claims 5-15 ,41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
14. Claim 20-21,31-32,39-40 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
15. The following is a statement of reasons for the indication of allowable subject matter:

With regard to cl. 1, the prior arts of record fail to anticipate or make obvious "clustering the defined insufficient-capacity data bins into bin-clusters having sufficient SNR for data transmission."

With regard to cl. 42, the prior arts of record fail to anticipate or make obvious "a cluster modulator [that] clusters the insufficient-capacity bins into bin-clusters for data transmission."

With regard to cl. 43, the prior arts of record fail to anticipate or make obvious "a modulation device [that] clusters individual data bins having a low signal-to-noise ratio (SNR) to produce a bin-cluster having a higher SNR than the individual data bins."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blanche Wong whose telephone number is 571-272-3177. The examiner can normally be reached on Monday through Friday, 830am to 530pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BW

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September 29, 2005


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